

REMARKS

In the Office Action, claims 3-4 were rejected under 35 USC §112, second paragraph. Claims 3 and 4 were rejected under 35 USC §103(a) as being unpatentable over Repella in view of Butler et al and Tadic et al.

By the present invention, a process is disclosed for making a sealing device having a sealing lip with a frustoconical air-side surface and a frustroconical oil-side surface. A harder helical portion is formed on the air-side surface. A hardness of the harder helical portion is harder than a hardness of the sealing lip. The process includes preparing a sealing device having a rigid annular casing, a molded elastomeric member bonded to the casing and a sealing lip defined by a frustoconical air-side surface and a frustoconical oil-side surface. Interdispersed portions of the frustoconical air-side surface are radiated with a ray of radiation to form the harder helical portion by inducing cross-linking and avoiding decomposition of the frustoconical airside surface. As a result, the frustoconical air-side surface is formed into concave shaped grooves and convex shaped ribs when the sealing device is in use with relative rotative movement between the sealing lip and a shaft. The convex shaped ribs have the hardness of the harder helical portion and the concave shaped grooves have the hardness of the sealing lip. Each of the concave shaped grooves is located between adjacent ones of the convex

shaped ribs. In addition, the frustoconical air-side surface snugly fits against an outer periphery of the shaft when there is no relative rotative movement between the sealing lip and the shaft.

Returning to the rejection of the claims, the Repella patent was cited as being illustrative of the general state of the art with a sealing device having a sealing lip with a frustoconical air-side surface and a frustoconical oil-side surface.

The Bulter patent was cited to show different degrees of hardness of various materials on an air-side surface of a sealing lip. However, by reference to column 4, line 65 through column 5, line 4, it is seen that in the sealing lip, portions having different physical characteristics are formed continuously in the sealing lip to seal an oil side "without the use of grooves or other hydrodynamic aids". It is believed in this patent that the difference in the physical characteristics of the materials forming two separate regions improves the hydrodynamic performance of the seal. The difference in hardness or degree of friction between the material forming a first region 20 and the second region 22 creates a pressure differential across the boundry. Therefore, there is no teaching of producing concave groove portions or convex rib portions.

Further, the Tadic et al patent teaches the radiation of an entire portion of a seal without separating adjacent portions to

form a plurality of concave shaped grooves and convex shaped ribs as is done in the present invention. In contrast, in the patent, an entire portion of the seal is radiated to increase the overall hardness of the entire portion.

Therefore, when considering that the Butler et al patent teaches avoiding the use of grooves and the Tadic et al patent teaches the radiation of entire portions of a seal, their combination would not arrive at or motivate one to arrive at the teachings of the present invention as defined in amended claim 3. Therefore, for at least the reasons cited above, independent claim 3 and dependent claim 4 should be considered allowable.

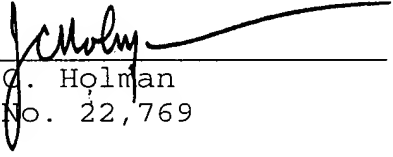
Based on the foregoing amendments and remarks, it is respectfully submitted that the claims in the present application, as they now stand, patentably distinguish over the references cited and applied by the Examiner and are, therefore, in condition for allowance. A Notice of Allowance is in order, and such favorable action and reconsideration are respectfully requested.

However, if after reviewing the above amendments and remarks, the Examiner has any questions or comments, he is cordially invited to contact the undersigned attorneys.

Respectfully submitted,

JACOBSON HOLMAN, PLLC

By: _____


John G. Holman
Reg. No. 22,769

400 Seventh Street, N.W.
Washington, D.C. 20004-2201
(202) 638-6666

Date: November 26, 2003
JLS/dmt